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Claims

1. An apparatus for charging a piezoelectric element (10, 20, 30, 40, 50 or 60), characterized in that an activation voltage and an activation charge value for driving the piezoelectric element (10, 20, 30, 40, 50 or 60) is controlled online by a control unit (D) which adjusts the activation voltage (U) and activation charge values in order to compensate for deviations caused by variations in the piezoelectric element's (10, 20, 30, 40, 50 or 60) layer thickness or the number of layers.

2. The apparatus as defined in claim 1, characterized in that the piezoelectric element (10, 20, 30, 40, 50 or 60) is an actuator in a fuel injection system.

3. The apparatus of claim 1 or 2, characterized in that the control unit determines the activation voltage value and the activation charge values respectively as a function of the piezoelectric element's (10, 20, 30, 40, 50 or 60) normal voltage, normal charge and a correction factor.

4. The apparatus of claim 3, characterized in that the correction factor is a function of a piezoelectric element's (10, 20, 30, 40, 50 or 60) normal travel distance and the piezoelectric element's (10, 20, 30, 40, 50 or 60) respective actual travel distance.

5. The apparatus of claim 4, characterized in that the control unit determines the correction factor by dividing the piezoelectric element's (10, 20, 30, 40, 50 or 60) normal travel distance by the piezoelectric element's (10, 20, 30, 40, 50 or 60) respective actual travel distance.

6. The apparatus of claim 3, 4 or 5, characterized in that the control unit (D) determines the correction factor as a function of temperature.

7. The apparatus of claim 5, characterized in that the normal travel distance and the respective actual travel distance are measured at substantially the same temperature.

8. A method for charging a piezoelectric element (10, 20, 30, 40, 50 or 60), characterized in that a definition is made, prior to charging, as to a value for an activation voltage (U) and a value for an activation charge of the piezoelectric element (10, 20, 30, 40, 50 or 60) as a function of batch variation in the travel of the piezoelectric element (10, 20, 30, 40, 50 or 60).

9. The method as defined in claim 8, characterized in that the piezoelectric element (10, 20, 30, 40, 50 or 60) is an actuator in a fuel injection system.

10. The method as defined in claim 8 or 9, characterized in that the activation voltage and the activation charge values respectively, are a function of the piezoelectric element's (10, 20, 30, 40, 50 or 60) normal voltage, the piezoelectric element's (10, 20, 30, 40, 50 or 60) normal charge and a correction factor.

11. The method as defined in claim 10, characterized in that the correction factor is a function of the piezoelectric element's (10, 20, 30, 40, 50 or 60) normal travel distance and the piezoelectric element's (10, 20, 30, 40, 50 or 60) respective actual travel distance.

12. The method as defined in claim 11, characterized in that

the control unit (D) determines that correction factor by dividing the piezoelectric element's (10, 20, 30, 40, 50 or 60) normal travel distance to the piezoelectric element's (10, 20, 30, 40, 50 or 60) respective actual travel distance.

13. The method as defined in claim 10, 11 or 12, characterized in that the control unit determines the correction factor as a function of temperature.

14. The method as defined in claim 13, characterized in that the normal travel distance and the respective actual travel distance are measured at substantially the same temperature.

15. The method as defined in claim 3-14, characterized in that the correction factor is measured as a part of the manufacturing process.

16. The method as defined in claim 3-15, characterized in that the correction factor is stored for each cylinder within an EEPROM of the control unit (D).

17. The method as defined in claim 16, characterized in that the correction factor can be read from the EEPROM for test purposes.